

Remarks

Claims 1-27 and 29-38 are pending in this application. Applicants have amended claims 1 and 27 to clarify the claimed invention. Claims 8-10, 15-26 and 29-38 are withdrawn from consideration by the Examiner as directed to non-elected inventions. Applicants respectfully request favorable reconsideration of this application.

The Examiner rejected claims 1-3, 5 and 27 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent publication 2001/0011197 to White in view of U.S. patent 5,914,880 to Yasojima and further in view of U.S. patent 5,041,907 to Sager. The Examiner rejected claims 6 and 7 under 35 U.S.C. § 103(a) as being unpatentable over White in view of Yasojima, further in view of Sager and further in view of U.S. patent 5,568,593 to Demarest. The Examiner rejected claims 11-14 under 35 U.S.C. § 103(a) as being unpatentable over White in view of Yasojima, further in view of Sager and further in view of U.S. patent 4,580,207 to Arai.

The combination of White, Yasojima and Sager does not suggest the claimed invention since, among other things, the combination does not suggest a method for controlling a plurality of machines each configured to pick up an item from one of a plurality of available first positions and place the item in one of a plurality of second positions. The combination also does not suggest sending a message from a master process of the control member including one or more of the available first positions to a machine controller of all machines controlled by the control member. Additionally, the combination does not suggest sending a message from a control

member to all machine controllers of with an indicator member specifying which of the one or more available first positions shall be used. Furthermore, the combination does not suggest picking up with one of the machines an item from the one of available first position to be used and moving the item to one of the second positions, receiving with the control member from the machine controllers of the machines a message that the one of the available first positions has been used, and sending from the control member to the machine controllers of the machines that the one of the available first positions has been used and is no longer available.

Along these lines, White does not suggest a plurality of machines. Rather, at page 3, paragraph 0025, lines 7-13, White clearly suggests a single pick and place subsystem 120 that includes a pick and place head 122. The single pick and place subsystem and pick and place head is shown in Fig. 2. White does not suggest a plurality of machines configured to pick up an item from one of a plurality of first positions and place the item in one of a plurality of second positions. Additional pick and place subsystems and pick and place heads are not shown or described.

The Examiner cites paragraph 0023 of White as suggesting communication of first positions to a plurality of machines for picking up items from the first positions. However, White does not suggest a plurality of machines for picking up items from the first positions. Therefore, White cannot suggest communicating position in formation among a plurality of machines for picking up items from the first positions. Additionally, paragraph 0023 merely suggests communication among subsystems.

Additionally, White does not suggest a plurality of first positions and a plurality of second positions. Rather, White suggests a single circuit board that moves through the apparatus. This is described at page 3, paragraph 0024. White does not show or describe more than one circuit board and/or more than one position in which the one circuit board could be arranged. As a result, White cannot suggest any of the steps of the invention recited in claim 1 that relate to providing data regarding first and second positions and/or providing the data to a plurality of machines.

Yasojima does not overcome the deficiencies of White. Along these lines, Yasojima also does not suggest any elements of the claimed invention not suggested by White. The Examiner cited Yasojima as suggesting sending a message from a control member to a plurality of machines. However, as pointed out above, White does not suggest a plurality of machines. Therefore, it is irrelevant whether Yasojima suggested sending such a message since White only suggests one machine.

Yasojima suggests a plurality of machining units 12 that carries out one step among a sequential series of process steps. Each machine carries out a different portion of the process. Yasojima does not suggest communicating available first positions to each machining unit. Each machining unit will perform its own function and would not machine a portion of a workpiece machined by another machining unit. Therefore, the machining units do not operate on the same first positions. There is also no need to communicate information regarding which portion of a workpiece that each unit has machined.

Furthermore, Yasojima does not suggest sending a message regarding a status of positions from which an item may be picked. The Examiner has only asserted that Yasojima suggests sending a message to a plurality of machines without any suggestion of the substance of the message.

Sager does not overcome the deficiencies of White or Yasojima. Along these lines, Sager also does not suggest any elements of the claimed invention not suggested by White or Yasojima. Along these lines, Sager explicitly states at col. 9, lines 18-36, and illustrates in Fig. 1 that each robot operates on a separate pick-up window. Sager states that this minimizes the idle time of the robots. On the other hand, according to the invention recited in claim 1, each machine can pick an item from an available first position. This increases the efficiency of the system. Since each robot operates on a different pick-up window, there is no need for communication among the robots of available first positions have been used. Furthermore, Sager does not suggest transmitting to all controllers which of available first positions has been used and is no longer available. If anything, as described at col. 8, lines 41-44, each robot downstream successively receives information regarding locations of objects that are unpicked. As stated by Sager, object locations cascade from one robot to the other. Thus, Sager does not suggest coordinated dissemination of positions to all robots.

In view of the above, the combination of White, Yasojima and Sager does not suggest the invention recited in claims 1-3, 5 and 27. Therefore, the invention recited in claims 1-3, 5 and 27 is not obvious in view of the combination of White, Yasojima and Sager. Accordingly, Applicants respectfully request withdrawal of this rejection.

The combination of White in view of Yasojima further in view of Sager and further in view of Demarest does not suggest the invention recited in claims 6 and 7 since, among other things, Demarest does not overcome the above-discussed deficiencies of White, Yasojima and Sager. Along these lines, Demarest does not suggest a method for controlling a plurality of machines configured to pick up an item from one of a plurality of available first positions and place the item in one of a plurality of second positions, providing with a sensor member data on the available first positions to a control member configured to control a plurality of machines each configured to pick the item from one of the available first positions and place the item in one of the second positions, sending a message from a master process of the control member comprising one or more of the available first positions to a machine controller of all the machines controlled by the control member, sending a message from the control member to all the machine controllers of the machines with an indicator member specifying which of the one or more available first positions shall be used, picking up with one of the machines an item from the one of available first position to be used and moving the item to one of the second positions, receiving with the control member from the machine controller one of the machines a message that the one of said available first positions has been used, and sending from the control member to the machine controllers of the machines that the one of the available first positions has been used and is no longer available.

In particular, Demarest does not suggest sending a message to all machines that a first position has been used. Along these lines, the Examiner asserts that Demarest suggests selecting a first position among a plurality of first positions to be handled by one machine of a plurality of

machines. However, Demarest only suggests grippers picking needles from conveyors and placing them in boats. Demarest does not include any suggestion of the messages regarding first positions and second positions. Demarest merely suggests that the needles are picked up off of the conveyors.

Additionally, Demarest does not suggest that the grippers are commonly controlled. Rather, Demarest suggests sending a message to either one of robot grippers 55a and 55b, with two robot controllers, not both. Along these lines, at col. 4, lines 24-34, and, in particular, lines 31-33, for example, Demarest states, "The control system of the invention instructs a robot gripper, for e.g. gripper 55a of the robot assembly 501, to grab the tracked needle". In other words, only one robot gripper is instructed by one controller.

Further evidence of this difference between the invention recited in claims 1, 6 and 7 and Demarest is provided by Fig. 7 and the passage at col. 7, line 7, through col. 8, line 31. Along these lines, Fig. 7 is a diagram showing control and data flow in the system suggested by Demarest. Col. 7, lines 51-59, suggests that there is a robot control task with each Adept® controller for each robot assembly 50a and 50b although only one controller is indicated in Fig 7. In other words, there are two robot control tasks for the two robot assemblies 50a and 50b.

Furthermore, at col. 7, lines 54-55, Demarest suggests one FIFO buffer for communication of needle locations from the Vision Control Task 160. As can be seen from col. 11, lines 19-20, there is only one vision control task. Additionally, col. 7, line 64, through col. 8, line 1, describes that the respective robot controller continuously polls the input FIFO to obtain

positional data for needle locations.

Demarest describes at col. 8, lines 4- 8, how, "When an acceptable (recognizable) needle position is entered into the FIFO buffer 155, the robot controller will remove the needle position from the buffer and direct the robot gripper arm 55a,(55b) to move to that location on the conveyor belt as indicated at step 104." In other words, according to Demarest, a robot controller, which is coupled to a single robot gripper, reads a location in the FIFO buffer, removes the entry from the buffer and effects movement of the associated gripper arm. By removing the entry from the buffer, it is no longer readable by any other robot controllers. In other words, the data entry with the location data has been received by only one robot controller.

Specifically, Demarest does not suggest that both robot controllers read the FIFO buffer and move both robot gripper arms to the indicated location. This would be inconsistent with the use of the FIFO buffer and also a waste of resources for no benefit. Instead, Demarest suggests how one robot controller reads the FIFO buffer and moves the coupled robot gripper. This allows the other robot controller to pick the next location from the FIFO buffer, whereby the robot grippers work in parallel.

This is further evidenced by Demarest to indicate the use of one of two alternatives. For example, col. 8, line 8 suggests "the robot gripper arm 55a,(55b)". Additionally, col. 8, line 10 describes "the robot gripper 55a,(55b)". Furthermore, col. 8, lines 28-29 describe "the Adept® robot 50a or 50b will attempt to place a needle onto a boat".

In other words, since Demarest utilizes a FIFO buffer to send location of needle positions to the robots, it is impossible that Demarest suggests "sending a message from a control member to all machines controlled by the controller". Sending location data to a FIFO buffer accessible for all robot controllers does not imply sending location data to all robot controllers since only one machine can receive each location data item from the FIFO buffer.

However, according to the claimed invention, by sending the message with positions to the controllers of all of the machines, a redundancy of information is achieved. Each of the machines keeps a list of positions, allowing another machine to take over if one machine experiences stoppage. This is a significant advantage of the claimed invention that results in greater reliability for pick and place operations. In contrast to this, Demarest is not concerned with having to pick each and every needle. This is supported by the disclosure of Demarest at, for example, col. 4, lines 35-43, which describes how needles can be positioned such that they can not be picked up by a robot gripper, whereby a recovery procedure is suggested.

In view of the above, the combination of White, Yasojima, Sager and Demarest does not suggest the invention recited in claims 6 and 7. Therefore, the invention recited in claims 6 and 7 is not obvious in view of the combination of White, Yasojima, Sager and Demarest. Accordingly, Applicants respectfully request withdrawal of this rejection. Furthermore, in view of the above, it is clear that the combination of White, Yasojima, Sager and Demarest does not suggest the invention recited in claim 1, from which claims 6 and 7 depend.

The combination of White, Yasojima, Sager and Arai does not suggest the invention

recited in claims 11-14 since, among other things, the combination does not suggest a method for controlling a plurality of machines configured to pick up an item from one of a plurality of available first positions and place the item in one of a plurality of second positions, providing with a sensor member data on the available first positions to a control member configured to control a plurality of machines each configured to pick the item from one of the available first positions and place the item in one of the second positions, sending a message from a master process of the control member comprising one or more of the available first positions to a machine controller of all the machines controlled by the control member, sending a message from the control member to all the machine controllers of the machines with an indicator member specifying which of the one or more available first positions shall be used, picking up with one of the machines an item from the one of available first position to be used and moving the item to one of the second positions, receiving with the control member from the machine controller one of the machines a message that the one of said available first positions has been used, and sending from the control member to the machine controllers of the machines that the one of the available first positions has been used and is no longer available.

Along these lines, Arai does not suggest a plurality of first positions or sending all first positions to a plurality of controllers of machines. Therefore, the combination of White, Yasojima, Sager and Arai does not suggest the invention recited in claims 11-14. Accordingly, the invention recited in claims 11-14 is not obvious in view of the combination of White, Yasojima, Sager and Arai. Consequently, Applicants respectfully request withdrawal of this rejection.

In view of the above, the references relied upon in the office action, whether considered alone or in combination, do not suggest patentable features of the claimed invention. Therefore, the references relied upon in the office action, whether considered alone or in combination, do not make the claimed invention obvious. Accordingly, Applicants submit that the claimed invention is patentable over the cited references and respectfully request withdrawal of the rejections based on the cited references.

In conclusion, Applicants respectfully request favorable reconsideration of this application and issuance of the notice of allowance.

If an interview would advance the prosecution of this application, Applicants respectfully urge the Examiner to contact the undersigned at the telephone number listed below.

The undersigned authorizes the Commissioner to charge fee insufficiency and credit overpayment associated with this communication to Deposit Account No. 22-0261.

Respectfully submitted,

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